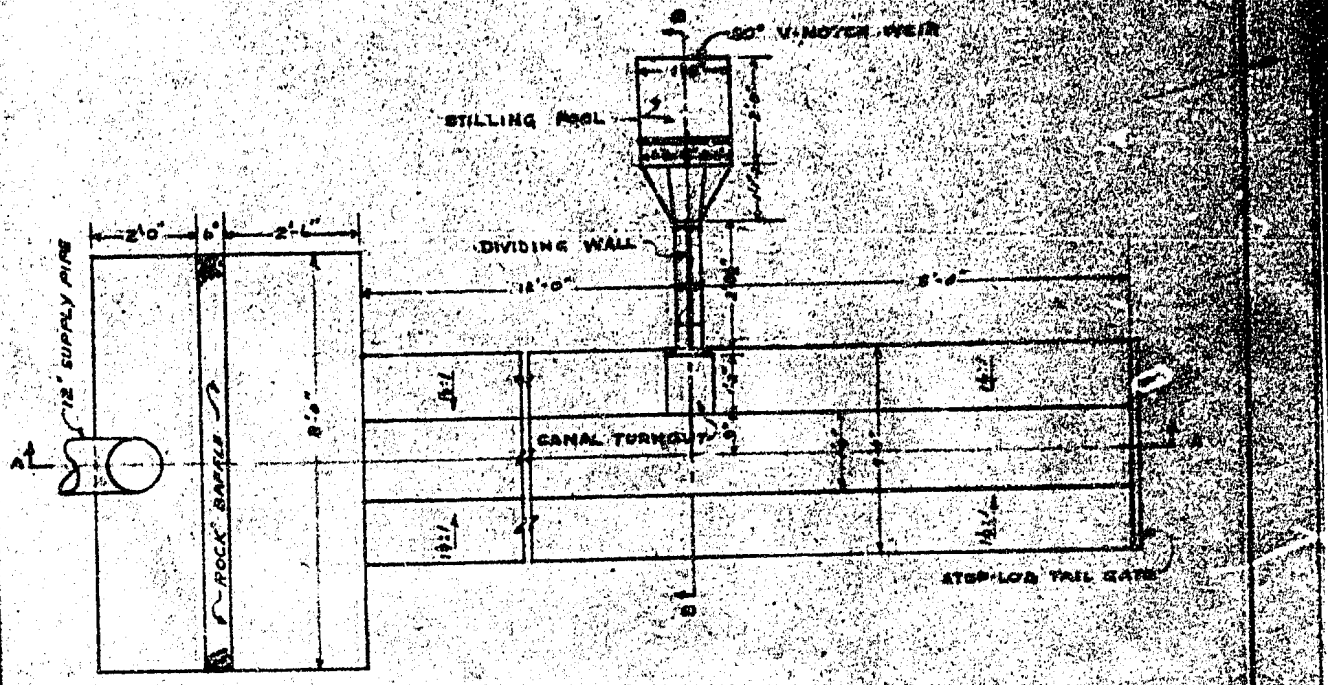
HYD-351

HYD 351

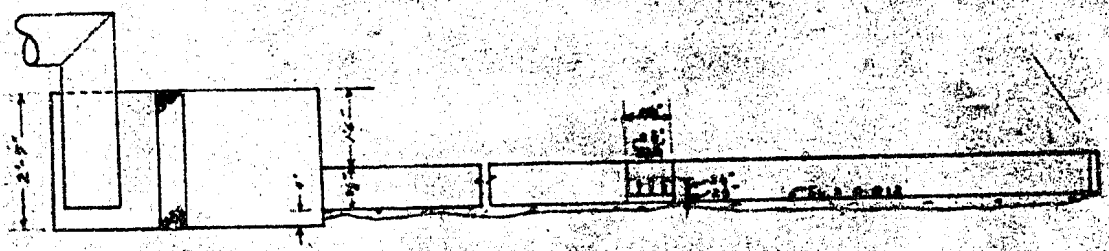
MASTER

FILE COPY

BUREAU OF RECLAMATION
HYDRAULIC LABORATORY
NOT TO BE REMOVED FROM FILES



PLAN



SECTION A-A

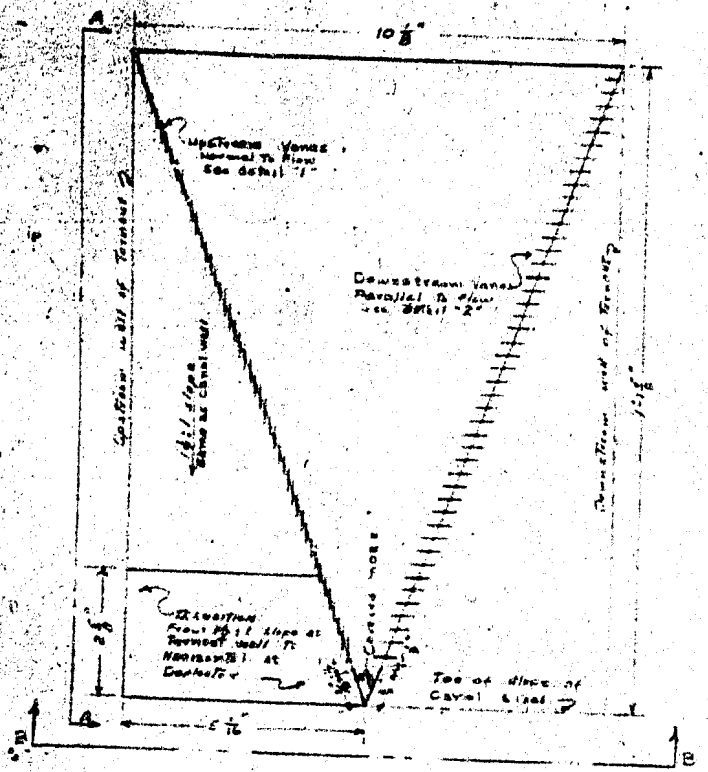
SECTION B-B

MODEL LAYOUT

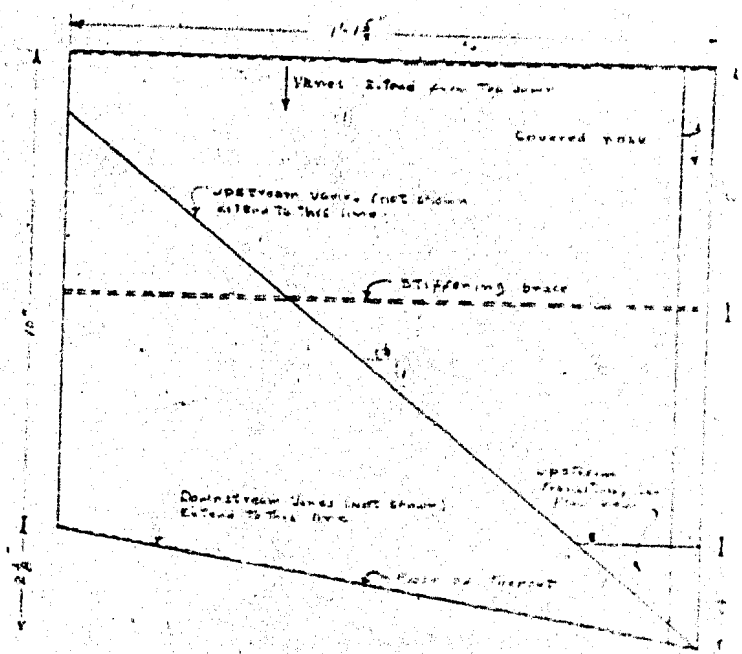
MOSS PREVENTION TESTS

FRIANT-KERN CANAL

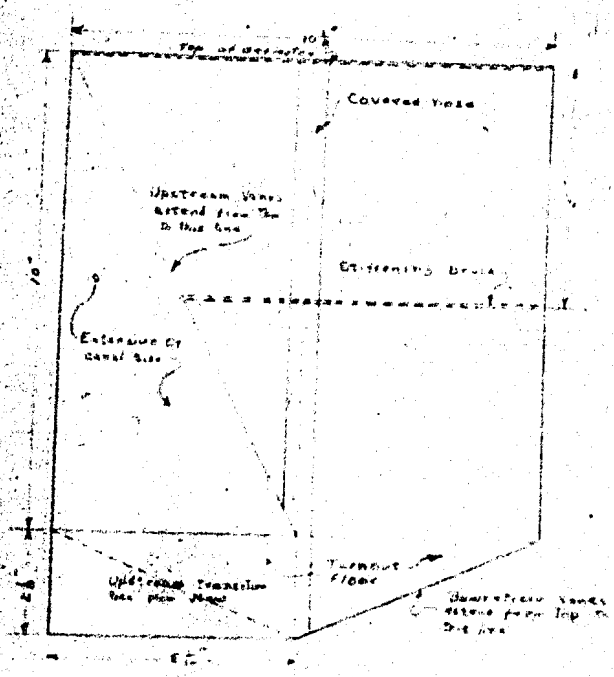
1:24 SCALE MODEL



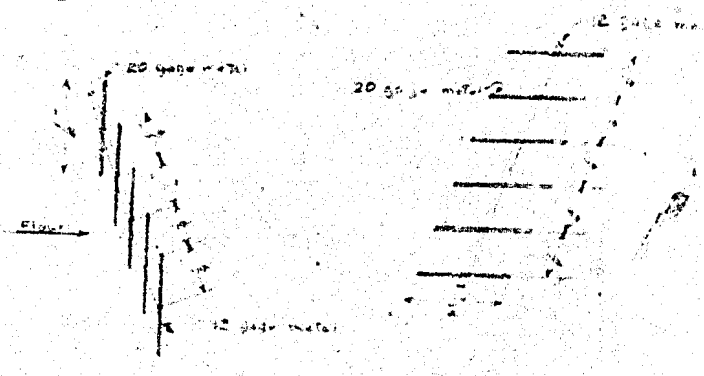
PLAN



ELEVATION A-A



ELEVATION B-B



DETAIL "1"
UPSTREAM VANES

DETAIL "2"
DOWNSTREAM VANES

MOSS DEFLECTOR
DETAILS of INSTALLATION OF DESIGN B

MOSS PREVENTION TESTS
FRIANT-KERN CANAL
1:24 SCALE MODEL

Canal discharge cfs	Turnout discharge cfs	Device designation	% Passed through turnout
2,000	200	none	11.4
	175	A	5.7
	189	B	1.9
	185	C	4.06
	184	D	3.71
1,500	200	none	14.9
	100	A	14.1
	191	B	6.7
	184	C	5.6
	183	D	5.8

3. It is apparent in the table that Device B provided the best operation for the 2,000 second-foot discharge in the canal. When the discharge was reduced to 1,500 second-feet, however, Devices C and D indicated better performance. The performance of Device B, however, was so nearly the same as C and D that on the basis of its better performance for 2,000 second-feet it was concluded that Device B was superior. No quantitative tests were made for other discharges, or other ratios of canal discharge to turnout discharge.

4. Enclosed in this memorandum are photographs showing the testing equipment and some of the devices described above. The captions on the photographs are self-explanatory. The enclosed drawings show the structure as tested, and the details of Device B which was recommended for field construction.

5. In the course of testing the moss prevention devices, many different ideas were investigated and only a few proved to have any merit whatsoever. The reason for this is that the problem, basically, proved to be extremely difficult to solve. To make a fully effective device, it is necessary to separate the debris from the water; and since the debris is of practically the same density as the water, it becomes next to impossible to introduce water into the turnout without introducing the debris as well.

6. Some of the devices which appeared promising on paper produced a back eddy in the vicinity of the intake. These devices concentrated the debris near the turnout entrance and proved to be worthless. Devices C and D made use of divider walls arranged so that the flow into the turnout was accomplished entirely through a narrow channel. Water entering the turnout caused a drop in the water surface in the narrow channel which accelerated the flow rapidly as it passed the turnout. It was hoped that the inertia of the debris would prevent its entry into the turnout. The idea could not be developed, however, to a satisfactory degree. In fact none of the schemes tested, including the most promising one, provided a satisfactory answer to the problem.

7. Although Device B, on the basis of the data submitted and on the opinion of those who saw the device operate, is considered superior, it is not in the opinion of the laboratory a satisfactory device, but it does provide the best answer obtainable at this time. It was agreed by all at the time of the tests that further investigations should be made. This was not done, however, because of a lack of workable ideas and a lack of a basic concept on how the problem should be attacked. Also, further investigations should be coordinated with field tests on a small turnout where the action of weeds and moss can be studied. It is felt that laboratory materials approximate the field materials but do not give exact answers.

8. It is hoped that these tests may be resumed in the future when some workable ideas are found. At the time of this writing, however, no new ideas are forthcoming.

Enclosures

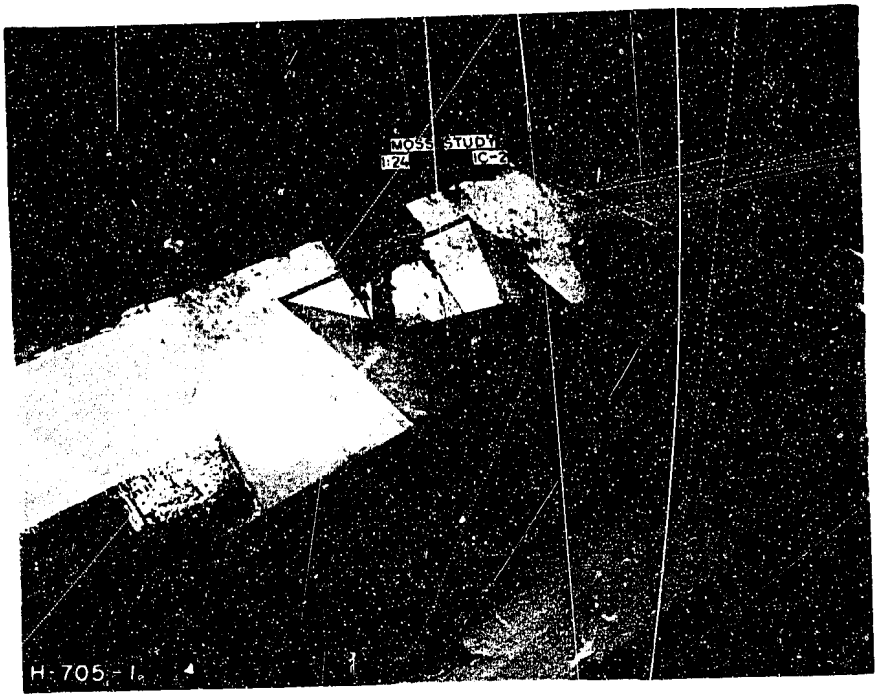


Photo 1

Device C' in place and ready for testing. Flow is from right to left.

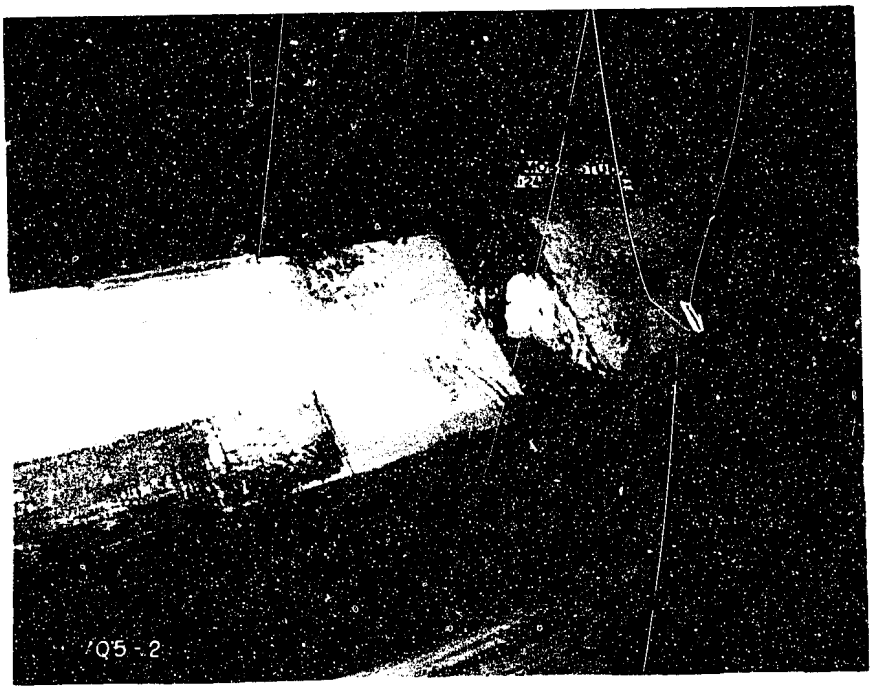


Photo 2

View of model canal showing box turnout.

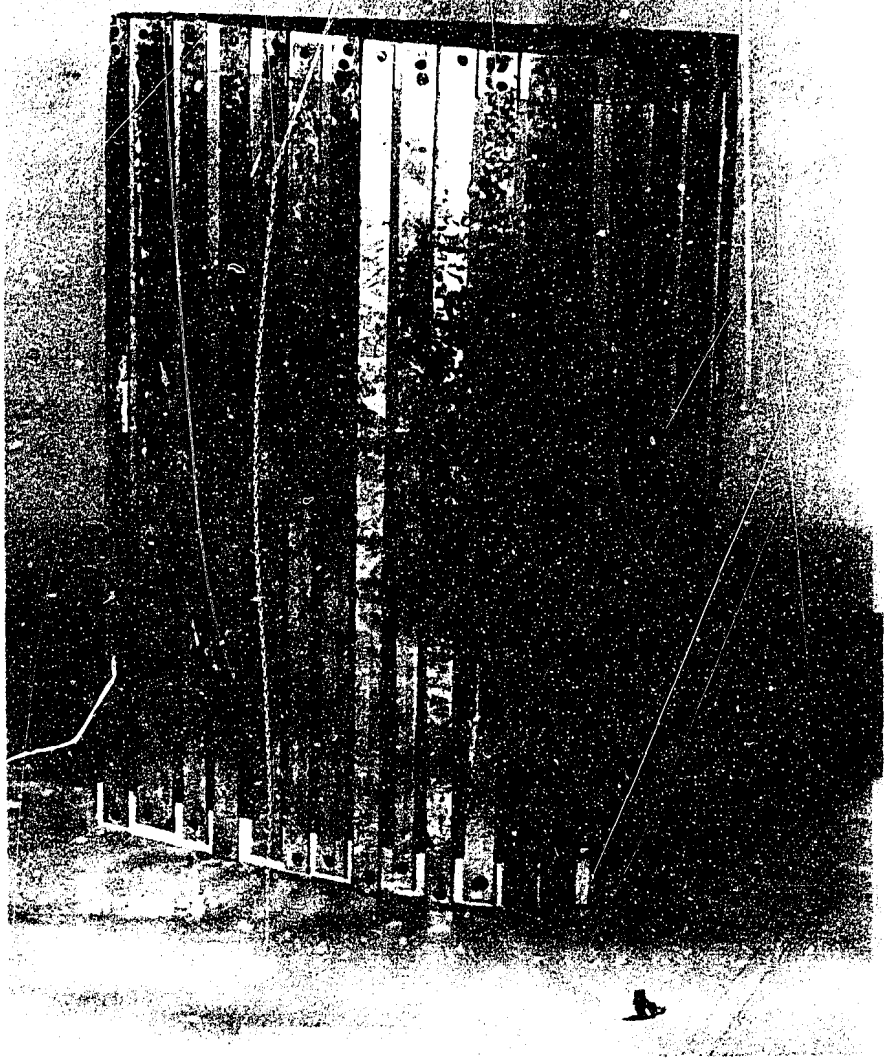
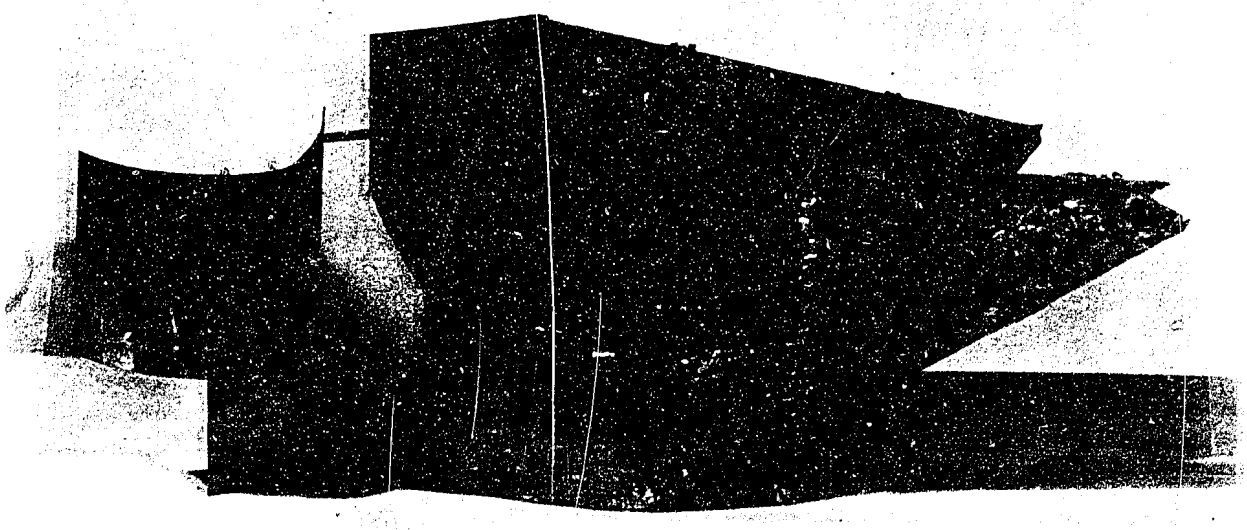


Photo 3

Device A was placed in front of the box turnout with the sharp radius of curvature placed upstream.

Photo 4



Device C was tested with various modifications. The sloping edge of the metal on the right in the photograph was placed against the canal bank.

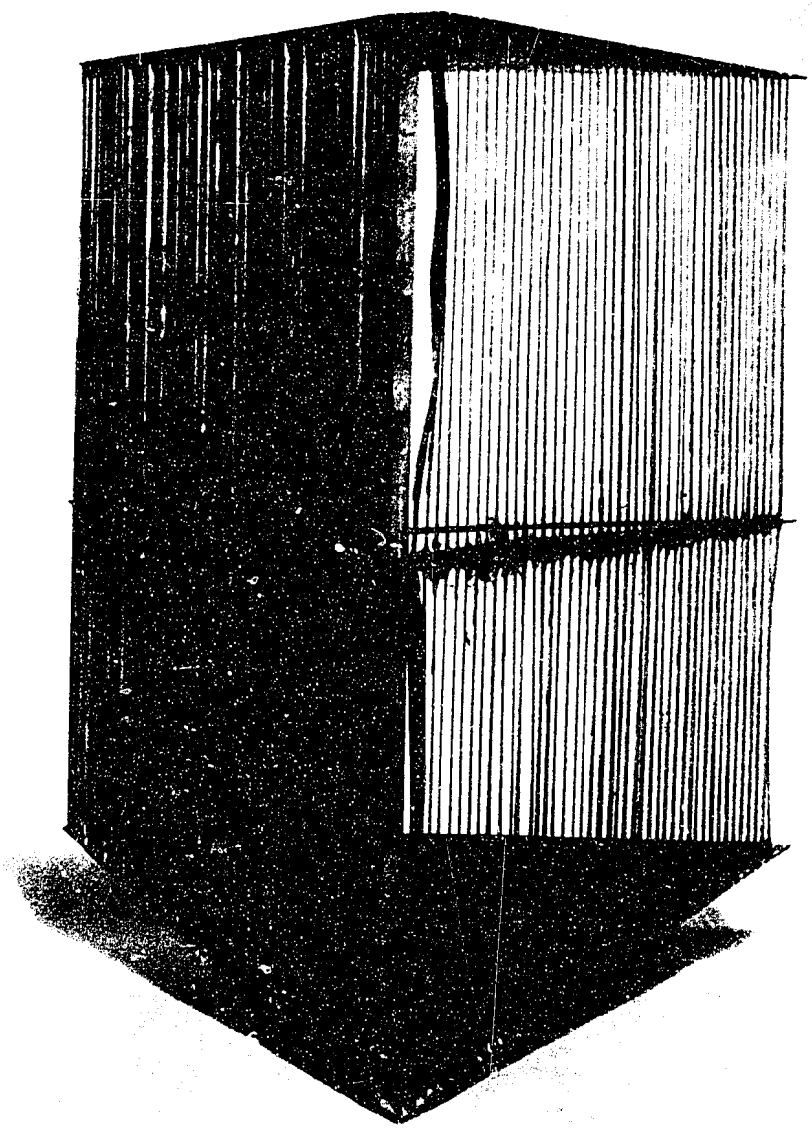


Photo 5

Device B which proved to be the best device tested. The damaged vane in the nose occurred after the tests.

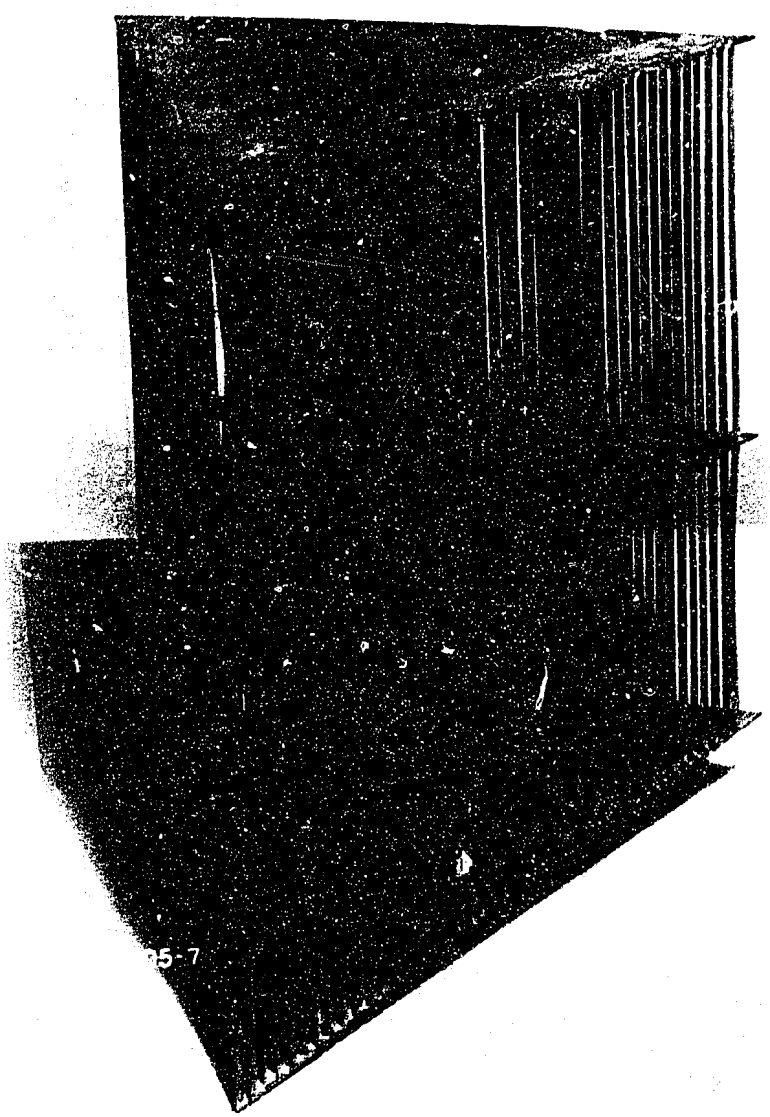


Photo 6

Another view of Device B.